

ABSTRACT OF THE DISCLOSURE

A lithium-sulfur battery includes a negative electrode, a positive electrode, and an electrolyte. The negative electrode includes a negative active material selected from materials in which lithium intercalation reversibly occur, lithium alloy or lithium metal. The positive electrode includes at least one of elemental sulfur and organosulfur compounds for a positive active material, and an electrically conductive material. The electrolyte includes at least two groups selected from a weak polar solvent group, a strong polar solvent group, and a lithium protection solvent group, where the electrolyte includes at least one or more solvents selected from the same group. The electrolyte may optionally include one or more electrolyte salts.